MAXIMIZING OUR EFFORTS:
THE MASSACHUSETTS STATE INJURY PREVENTION PLAN

•2006•

Massachusetts Department of Public Health

Center for Community Health
Division of Violence and Injury Prevention
Injury Prevention and Control Program

Center for Health Information, Statistics, Research and Evaluation
Injury Surveillance Program

EXECUTIVE SUMMARY

Introduction: Injury is a major public health problem in both the United States and Massachusetts and is the leading cause of death for people ages 1 – 44. Nevertheless, the nation's and this state's current investment in injury prevention programs and research is not commensurate with the magnitude of the problem. To address this situation, the Massachusetts Department of Public Health (MDPH) Injury Prevention and Control Program (IPCP) and Injury Surveillance Program (ISP) have prepared this plan to document the problem of injury in Massachusetts and to identify steps to be taken to more effectively use existing resources for the purpose of prevention.

Background: The health of Massachusetts' residents is compromised by the impact of injuries. In 2003, the impact was 2,726 deaths, 63,857 inpatient hospitalizations and 751,187 emergency department visits. In 2004, injuries resulted in 64,618 inpatient hospitalizations and 718,334 emergency department visits. The financial burden of injuries is tremendous. The national cost of injuries is estimated at more than $224 billion each year, and in Massachusetts, hospital charges alone are known to be over $1 billion per year.

Historically, the most successful public health injury prevention programs combine three types of intervention strategies:

- Engineering or technological interventions;
- Education and behavior changes; and
- Passage of new laws and enforcement of new or existing laws and regulations.

The literature has identified six major challenges common to most injury prevention programs that are aimed at the primary prevention of these events:

1. Key decision makers and the general public may be unaware of the magnitude of the injury problem.
2. Many injury prevention programs suffer from a lack of timely, high-quality data.
3. Well-documented, effective interventions are lacking for some injury causes.
4. Our society glorifies risk taking; safety has a poor public image.
5. In most communities, few professionals are trained in injury epidemiology and injury prevention.
6. The survival of injury prevention programs is threatened by uncertain funding and support.

The Use of a Strategic Plan: Established in 1979, IPCP is one of the oldest and most comprehensive injury prevention programs in a state health department, yet in its 25 year history, it has never had a state plan. Because of this, prevention efforts have been fragmented, and injuries as a whole remain an unrecognized public health problem in the state.

Even with a strategic plan, injury prevention is a shared responsibility. It requires collaboration between many partners including public and private agencies, product manufacturers, the media, policy makers, health care providers, educators, law enforcement, fire safety personnel, advocates, survivors, private citizens and other stakeholders. Working together can increase the efficiency of all of the individual efforts, adding value to these efforts and improving the effectiveness of the state injury prevention infrastructure as a whole. Massachusetts is fortunate to have a wealth of programs whose mission is, or includes, injury prevention. Over the years, the IPCP and ISP have worked collaboratively with most of these programs in a variety of ways.

In addition to working with external partners, we need to integrate prevention work into other MDPH programs. Public health programs have the capacity to reach the most vulnerable populations, e.g. through the WIC Program, home visiting programs, substance abuse services, school health, elder health and other programs.

The broad category of injury includes two major types: intentional and unintentional injury. Intentional injury involves homicide, suicide, assault, abuse and other violent acts. Unintentional injuries are those that have previously, and incorrectly, been thought of as "accidents." Generally, these include injuries that are motor vehicle related, falls, poisonings, drownings, fire and burns, and others. Only unintentional injuries are considered in this plan, with the exception of poisonings, where injuries of undetermined intent are included.

Priorities and Next Steps: This plan should be considered as a starting point. It will be used in further planning sessions with internal and external stakeholders to create and refine measurable goals and objectives with timeframes and priority strategies. It must be revisited regularly as additional information becomes available from existing and future data sources. In this effort, we will use a data-informed process that prioritizes injuries according to frequency, impact and feasibility of intervention.

There are a number of overarching needs that must be addressed in order to reach our full potential for preventing injuries in Massachusetts. These include:

- Integration of injury prevention efforts into all relevant MDPH programs;
- Improvements in injury surveillance to enhance our ability to provide critical data in a timely manner;
- Improvement in the dissemination of data to other MDPH programs, external agencies, organizations, key decision makers and the public;
- Support for the statewide system of Child Fatality Review Teams;
- Development of a public information/social marketing strategy; and
- Enhancement of the capacity to support injury prevention efforts at the local level.

Focal Areas for Prevention: The following injuries have been selected as priorities based on a review of existing data, and known, effective interventions: motor vehicle-related injuries, elder falls, poisonings, and fire and burns. Two overarching issues that we will integrate into each of these priorities are the prevention of traumatic brain injury (TBI) and the risk factor of alcohol and other substances.

1. **Improve motor vehicle occupant safety**
   - Promote passage of a primary seat belt law.
   - Enhance all existing traffic safety-related coalitions and partnerships.
   - Broaden the scope of activity to include TBI prevention.
   - Promote community interventions to increase the use of safety restraints and reduce alcohol-impaired driving.
   - Enhance surveillance data on motor vehicle injuries through database linkage and expansion of data sources to include EMS.
   - Identify factors that contribute to elder motor vehicle crashes and develop action plans to reduce the associated risk.

2. **Prevent elder fall-related injuries**
   - Build a coalition to develop a strategic prevention plan for elder falls.
   - Develop a campaign to eliminate safety hazards in the home.
   - Enhance awareness of elder alcohol use.
   - Work with the MDPH Elder Health Program to promote exercise for elders.
   - Enhance surveillance data to include information on how and where falls occur.

3. **Reduce poisonings**
   - Develop a multi-disciplinary coalition to prevent poisoning.
   - Work with the MDPH Bureau of Substance Abuse to enhance drug treatment availability.
   - Work with the Regional Poison Control and Prevention Center to promote outreach and education to non-English speaking populations.
   - Develop an education plan to prevent childhood poisonings targeted at parents and caregivers.
   - Expand the data collected on poisonings to include more detail on the poisoning agents.

4. **Reduce fire and burn related injury**
   - Continue to support community level promotion of smoke alarm installation.
   - Develop a public education campaign for families that focuses on escape plans.
   - Develop a public education program to reduce the incidence of scalds.
   - Collaborate with the Department of Fire Services to implement efforts to reduce the incidence of smoking in the presence of supplementary oxygen.
   - Improve the reporting of burn injuries by health care providers.

I. INTRODUCTION

Injury is a major public health problem in both the United States and Massachusetts and is the leading cause of death and disability for people ages 1 – 44. Despite that startling statistic, the nation's and this state's current investment in injury prevention programs and research is not commensurate with the magnitude of the problem; most injury prevention programs within state health departments are small, fragmented and limited in resources.[1] To address this problem, the Massachusetts Department of Public Health (MDPH) Injury Prevention and Control Program (IPCP), in collaboration with the Injury Surveillance Program (ISP), has prepared this plan. The purpose of the plan is to document the problem of injury in Massachusetts and to identify steps to be taken to more effectively use existing resources, strengthen our infrastructure, coordinate our efforts, and prioritize injury prevention interventions. The plan serves as the starting point for the development of a more comprehensive state plan for injury prevention.

II. BACKGROUND

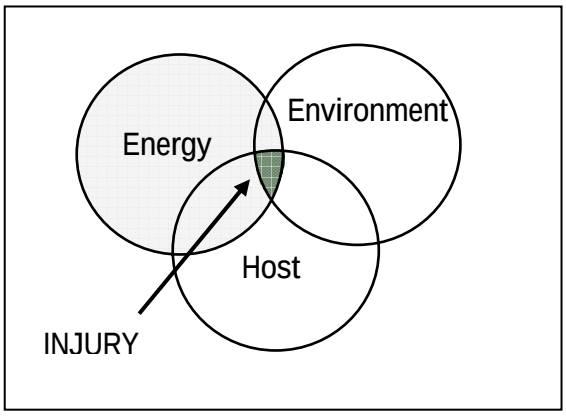
Injury in Massachusetts

The health of Massachusetts' residents is compromised by the impact of injuries. Injury is the leading cause of death and disability for children and adults, ages 1 – 44. Every day in Massachusetts 8 people die, 177 are admitted to a hospital and 1,968 seek hospital emergency department treatment because of an injury. In 2003, 2,726 Massachusetts residents died as a result of an injury, and in 2004 there were nearly 65,000 inpatient hospitalizations and 720,000 emergency department visits.

The financial burden of injuries is tremendous. The national cost of injuries, including medical care, rehabilitation, and lost wages and productivity is estimated at over $224 billion each year. While the total economic cost of injuries in Massachusetts is unknown, the hospital charges alone are over $1 billion per year.[2]

Preventing Injury

Injury is defined as unintentional or intentional damage to the body resulting from acute exposure to mechanical, thermal, electrical, or chemical energy or from the absence of such essentials as heat or oxygen. The term "injury" has been adopted by the public health community to replace "accident" when describing both fatal and nonfatal events. Injuries are not chance occurrences, but are understandable, predictable, and preventable.



Historically, the most successful public health injury prevention programs combine three types of intervention strategies. These are categorized as:

- Engineering/technological interventions: Changes in the design of products or of the physical environment.
- Education/behavior change: Efforts to alter specific injury-related behaviors in the population at large or in targeted groups.
- Enforcement/legislative interventions: Passage and enforcement of new laws and regulations, or the increased enforcement of existing ones.

Injury prevention experience suggests that "passive" countermeasures are generally the most effective since these require little or no individual action on the part of those being protected. Conversely, "active" countermeasures are less reliable because they are more subject to human error. Child-resistant medicine caps are an example of a passive countermeasure, while action required to put on a bicycle helmet is an active countermeasure.

Another important milestone in the history of injury prevention was the development of the "Haddon Matrix." In 1966, William Haddon, M.D., described the pre-event, event and post-event strategies that could be applied to the person, the injury-producing instrument and the environment to prevent or reduce the effects of injury.

The Haddon Matrix - An Example: Motor Vehicle Injury[3]

Factors / Phases	Human Factors	Agent or Vehicle	Physical Environment	Sociocultural Environment
Pre-event	Driver vision, alcohol intoxication, experience & judgement, amount of travel	Brakes, tires, center of gravity, speed, ease of control, load characteristics	Visibility of hazards, road curvature & gradient, intersections, signalization, etc.	Attitudes about alcohol, laws on impaired driving, speed limits, enforcement, support for injury prevention
Event	Safety belt use	Speed capability, vehicle size, automatic restraints, placement, air bags, hardness, sharpness of contact surfaces, load containment	Recovery area, guard rails, median barriers, roadside embankments, speed limits	Attitudes about safety belt use, laws about safety belt use, enforcement of child safety seat laws, motorcycle helmet use laws
Post-event	Age, physical condition	Fuel system, integrity	Emergency communication systems, access to and quality of EMS, Rehab programs	Support for trauma care systems, training of EMS providers

Challenges

A 1989 landmark book, "Injury Prevention: Meeting the Challenge" identified 6 major challenges common to injury prevention programs.[4] Though progress has been made, these challenges remain with us today.

1. Key decision-makers and the general public may be unaware of the magnitude of the injury problem in comparison with other health problems.
2. Many injury prevention programs suffer from a lack of timely, high-quality data on nonfatal injuries in their community.
3. Well-documented, effective interventions are lacking for some injury causes (e.g. suicide) and populations (e.g. adolescents).
4. Our society glorifies risk taking; safety has a poor public image.
5. In most communities, few professionals are trained in injury epidemiology and injury prevention.
6. The survival of injury prevention programs is threatened by uncertain funding, as well as by the absence of support from agency heads or the community.

These challenges will all be taken into account in the further development of the state plan, as will injury prevention theory and our practical experiences in developing and delivering an injury prevention program.

III. THE NEED FOR A STRATEGIC PLAN

The State and Territorial Injury Prevention Director's Association (STIPDA) identifies determining the burden of injuries and developing a plan of action as the first steps in the public health approach to injury prevention. STIPDA has recommended that such an assessment and planning process be a core component of every state's injury prevention efforts. The state action plan is part of the critical effort of building infrastructure. Within the context of injury prevention, "infrastructure" refers to three components[5]:

- **Organizational Strength:** the commitment of the agency – in this case MDPH – to assume a leadership role in preventing injury. The state plan is a product of this leadership commitment.
- **Staffing:** Key staffing positions should be permanent with permanent sources of funding, trained and diverse.
- **Funding:** There are many potential sources of funding for injury prevention initiatives, but central to a sustained, broad-based effort is consistent and stable funding that comes from a line item in the state budget.

The MDPH Injury Prevention and Control Program was established in 1979 through a grant from the federal Maternal and Child Health Bureau and is one of the oldest and most comprehensive injury prevention programs in a state health department. Yet, during its 25-year history, the IPCP has not had stable funding, adequate staffing or a state plan. Most of the programmatic efforts have been driven by available federal grants. Like other state injury prevention programs without a state plan, the IPCP's efforts are fragmented,

and injuries as a whole remain an unrecognized public health problem. The field of injury prevention is broad and complex, and it is constantly changing to address newly emerging issues. A comprehensive plan will provide the foundation to develop a roadmap for injury prevention and surveillance programs in order to maintain a flexible response to this dynamic field.

Partnerships

Injury prevention is a shared responsibility. It requires collaboration between many partners including public and private agencies, product manufacturers, the media, policy makers, health care providers, educators, law enforcement, fire safety personnel, advocates, survivors, private citizens and other stakeholders. Working together can increase the efficiency of all of the individual partners' efforts, adding value to these efforts and improving the effectiveness of the state injury prevention infrastructure. This multidisciplinary collaboration is also needed to affect legislation, regulations, and public attitudes towards injury prevention. Massachusetts is fortunate to have a wealth of agencies and organizations whose mission is, or includes, injury prevention. In the 2002 edition of the Massachusetts Injury Prevention Yellow Pages, the IPCP identified 23 MDPH programs that were injury related, as well as another 63 programs in other agencies throughout the state. Over the years, the IPCP and ISP have worked collaboratively with most of these programs, through advisory boards, conference planning efforts, development of policy, and specific interventions.

In addition to working with external partners, injury prevention work needs to be integrated throughout MDPH programs. Public health programs have the capacity to reach the most vulnerable populations – through the WIC (Women, Infants and Children) Program in nutrition, home visiting programs, substance abuse services, school health, elder health and others. Working collaboratively with these programs, we can expand and strengthen our injury prevention efforts.

Scope of this Report: Unintentional Injury

The broad category of injury can be better understood if it is broken down into two components – intentional and unintentional injury. Intentional injury involves homicide, suicide, assault, abuse and other violent acts. Unintentional injuries are those that have previously, and incorrectly, been thought of as "accidents." Generally, these injuries include those that are motor vehicle related, falls, poisonings, drowning, fire and burns, and others.

Only unintentional injuries are considered in this report. The only exception is in the area of poisonings, where injuries of undetermined intent are included. Injuries of undetermined intent reflect events in which the medical examiner or treating clinician was uncertain if the injury was unintentional, self-inflicted or assault-related. In Massachusetts most fatal drug overdoses of illicit substances are classified as "undetermined intent." This differs from classification protocols used for these injuries

by most other states. As it is likely that many of these injuries are unintentional, we have combined these two categories for poisonings only.

This report serves only as a starting point. It will be used in planning sessions with internal and external stakeholders to create and refine measurable goals and objectives with timeframes and to identify partners for implementing priority strategies. It must be revisited regularly as additional information becomes available from existing and future data sources. The IPCP will use a data-informed process that prioritizes issues according to frequency, impact and feasibility of intervention.

IV. NEXT STEPS AND PRIORITIES

This report has been developed by a large number of internal and external stakeholders (See list, Appendix B). The first step in maximizing our efforts will be to formalize our long-standing collaborations by convening an Injury Community Planning Group. This group will help to refine the plan to include goals, objectives, activity time lines, and targeted completion dates for selected categories of injuries. Intervention strategies and evaluation plans will be based on the best scientific practices.

In addition to setting priorities for the prevention of individual categories of injuries to be discussed below, there are a number of critical needs that must be addressed in order to reach our full potential for preventing injuries in Massachusetts. These include:

- Integration of injury prevention efforts into all relevant MDPH programs, maximizing a coordinated effort within the Department.
- Improvements in injury surveillance to enhance our ability to provide critical data in a timely manner.
- Improvement in the dissemination of data to other MDPH programs, external agencies and organizations, key decision-makers, and the public.
- Support for the statewide system of Child Fatality Review Teams as a means of preventing future deaths and injuries.
- Development of a public information and social marketing strategy.
- Enhancement of the capacity to support injury prevention efforts at the local level.

A. Integration of Injury Prevention into MDPH Programs

At present writing, the MDPH Injury Prevention and Control Program has neither adequate staffing nor stable funding. How, then, can we maximize our impact in preventing injuries? We should begin by sharing resources through the integration of injury prevention efforts into every relevant MDPH program. The mechanisms for accomplishing this include staff training, building injury prevention into program contracts with outside agencies, distribution of injury prevention materials to MDPH clients, and the provision of regular communication with, and technical assistance to, MDPH program staff.

The following programs are particularly appropriate for collaboration with injury prevention initiatives:

- **Occupational Health Surveillance Program (OHSP)**

OHSP collects data on certain work-related illness and injuries, including fatal occupational injuries, occupational lead poisoning, asthma, chemical poisonings and work-related injuries to teenagers. Data collected are used to develop prevention and education programs. OSHP and IPCP program staff work closely to track work-related injuries, particularly in the areas of poisonings, burns and youth fatalities. These two programs will continue to collaborate on surveillance and prevention efforts. OSHP staff will play a critical role on the Injury Community Planning Group.

- **The WIC Program**

The Special Supplemental Food Program for Women, Infants, and Children (WIC) provides food and nutrition counseling to high risk women, infants and children across the state. WIC counseling includes a direct link with primary health care and provides access to immunizations and information on many maternal and child health-related issues. This information should include child and adult safety and injury prevention messages, focusing on poison prevention, fire safety and motor vehicle occupant safety.

- **The Bureau of Substance Abuse Services (BSAS)**

BSAS has a strategic plan that should be integrated with any injury prevention activities where alcohol or substance abuse plays a role. This would include motor vehicle-related injuries, elder falls, poison prevention, and fire safety.

- **The Elder Health Program**

The Elder Health Program sponsors the "Keep Moving" Program to encourage elders to get physical exercise for better health, improved strength and fall prevention; IPCP should provide fall prevention materials to this program. In addition, IPCP and Elder Health staff should collaborate closely to develop a specific and comprehensive fall prevention program that will complement this and other elder health initiatives.

- **The School Health Program**

The School Health Program works to support and train school nurses throughout the state. These nurses can be critical resources in promoting motor vehicle occupant safety, pedestrian safety, fire prevention and poison prevention.

The School Health Program also funds and supports School-Based Health Centers in public high schools. These centers are staffed by nurse practitioners who provide primary health care to many adolescents and can be instrumental for conveying injury prevention messages to this population.

- **Violence Prevention Programs**

Violence Prevention Programs at MDPH include the Sexual Assault Nurse Examiner Program, Batterer Intervention Services, Rural Domestic Violence Prevention, Refugee and Immigrant Safety, Abuse Prevention in Racial and Ethnic Communities, Suicide and Violence Prevention for Gay and Lesbian Youth, and Sexual Assault Prevention Services. Each of these programs reaches populations that are at high risk for unintentional as well as intentional injuries; program staff can assist IPCP in providing injury prevention education to these clients.

- **Physical Activity and Other Health Promotion Programs**

These programs provide excellent opportunities to work together to reach shared goals of improving the health and safety of all Massachusetts residents. For example, concepts such as Smart Growth and initiatives such as Safe Routes to School combine strategies for increasing physical activity with improving safety through environmental policy and behavior change.

- **Healthy Homes**

This program provides home visits to high risk families and can easily incorporate injury prevention messages and materials to all age groups within the context of the family. Home visitors can also become involved in promoting environmental changes (e.g. functioning smoke alarms), as well as educating families (e.g. encouraging the development of an escape route in case of a fire).

- **The Office of Emergency Medical Services (OEMS)**

OEMS coordinates emergency services for Massachusetts. EMTs and paramedics are very interested in injury prevention, particularly motor vehicle safety and fire prevention. Many of the local ambulance services are operated by the town fire department. IPCP and the EMS for Children Project have recently awarded small injury prevention grants to nine ambulance services in communities across the state to carry out injury prevention projects in their service areas. Continued collaboration with EMS will greatly extend and enhance the resources of IPCP.

- **Family and Early Intervention Home Visiting Programs**

Any MDPH program that includes home visits to families could provide injury prevention messages and materials to their clients, relating in particular to child car seat use, environmental risks for falls, poison prevention and fire safety.

Staff from each of these programs should be active participants on the Injury Community Planning Group.

B. Improvements in Injury Surveillance

No viable work can be accomplished in injury prevention without an active and integrated surveillance program. The MDPH Injury Surveillance Program (ISP) contributes to the reduction of injuries among Massachusetts residents through the ongoing collection, analysis, interpretation and dissemination of data on injury events to injury prevention practitioners. Data analyses include descriptions on the magnitude, trends, risk factors and circumstances of these injuries, and they can be used to inform decisions on the development and evaluation of prevention initiatives and policies.

The Injury Surveillance Program utilizes nine of the eleven core injury data sets recommended in "Consensus Recommendations for Injury Surveillance in State Health Departments" (published by STIPDA), as well as other datasets to quantify and describe the injury problem in Massachusetts. Data sets include:

- MA Death Data Files from the Registry of Vital Records and Statistics
- MA Hospital Discharge Database
- MA Emergency Department Database
- MA Medical Examiner Data
- Supplemental Homicide Reports
- MA Youth Risk Behavior Survey
- Behavioral Risk Factor Surveillance System
- Fatality Analysis Reporting System
- National Occupant Use Protection Survey
- MA Outpatient Observation Stay Database
- Drug Abuse Warning Network (DAWN)

ISP administers these injury surveillance system data sets:

- Weapon Related Injury Surveillance System (WRISS)
- The National Violent Death Reporting System - Massachusetts (NVDRS-MA) – which collects detailed, linked information on all suicides, homicides, and deaths of undetermined intent occurring in Massachusetts.

At present, there is no stable funding for any general injury surveillance within MDPH. Nevertheless, the ISP will continue to work with the IPCP to 1) define and delineate priority surveillance areas; 2) enhance the integration of surveillance data with prevention activities; 3) evaluate the quality of surveillance data on an ongoing basis; and 4) recommend, where appropriate and feasible, the expansion of the data sets used by MDPH for surveillance purposes.

C. Improvement in the Dissemination of Data

Presently, a number of MDPH programs actively collect and use data as part of their planning process; others do not. Those programs that do collect and use data may or may not use injury surveillance data along with their own program data. Those programs that

do not collect or use data may or may not recognize its importance in evaluating the success of their program's activity.

IPCP and ISP currently produce data reports on injury that are user-friendly; these reports are available to internal and external partners on an ongoing basis. The Injury Community Planning Group and the further development of strategic planning for injury prevention will give IPCP and ISP enhanced opportunities to share data being collected and reported. Staff training on the importance of data and its use in planning and evaluation will be part of the task of the Council.

D. Support for Child Fatality Review Teams

The purpose of Child Fatality Review is to decrease the incidence of preventable child deaths and injuries. The Massachusetts Child Fatality Review law, passed by the state legislature in October 2000, established Local Teams within each of the 11 District Attorneys' offices and a State Team within the office of the Chief Medical Examiner. No funding was provided.

The Local Teams collect information on individual cases, discuss case information in team meetings, and advise the State Team by making recommendations for changes in law, policy and practice that will prevent child deaths. Local Teams also take action at the community level to enhance the safety of children. Through the review process, Child Fatality Review Teams promote collaboration among the agencies that respond to child deaths and/or provide services to families.

The teams have been particularly active in making recommendations for adolescent suicide prevention and increased attention to mental health issues. Other issues that have produced recommendations for change have included safe sleeping practices for infants to prevent suffocation, community coalitions to prevent teen motor vehicle crashes and the development of a standardized protocol to review infant death scenes. The Child Fatality Review teams offer a unique opportunity to combine a diverse array of information often not readily available and to review the circumstances surrounding a child fatality from multiple perspectives. At least one MDPH staff person participates as a permanent member on each Local Team; these staff should also participate as members of the Injury Community Planning Group.

E. Development of a Public Information and Social Marketing Strategy

Public information and social marketing are keys to changing the prevailing attitude that unintentional injuries are accidents and therefore not preventable. A critical component in reaching the public with injury prevention information and messages is to develop a media strategy that will enhance the information presented to the public. For example, in the past, the *Boston Globe* has sponsored a child safety campaign that was very effective in bringing the issue of childhood injury to public attention. Campaigns of this type could be increased in number and in diversity of topics. They could be targeted to

different cultural and ethnic audiences and produced for a variety of media including newspaper, radio, television and the Internet.

F. Support for Local Efforts

Injury prevention happens at the local level, and IPCP has a history of reaching out to community agencies to support injury prevention projects. In 1986, nine agencies received grants totaling $200,000 to implement community-based projects. The agencies included a suburban health department, an early intervention program, a community action weatherization program, a lead poisoning prevention program a home health agency, a children's medical center, a big city health commission, a rural WIC program and a regional Visiting Nurse Association. Several years later smaller amounts of funding were made available to communities to evaluate and upgrade their playground safety. IPCP has received two fire prevention grants from the Centers for Disease Control (CDC). The first was awarded in 1997 for three years, and the second in 2002 for five years. Both have made funding available to community agencies to provide smoke alarms, installation and fire safety education to high risk families in throughout Massachusetts.

Finally, in 2004 the Emergency Medical Services for Children (EMSC) Project awarded small grants to nine local ambulance services across the state to conduct childhood injury prevention activities in their communities. Several of the grantees elected to train EMTs and paramedics as child passenger safety technicians and sponsor child safety seat checkpoints. Other grantees conducted programs in schools on motor vehicle, fire safety and CPR. Other community-based activities included recreation safety and home safety. It is anticipated that a second round of these grants will be awarded in 2005.

IPCP support for local injury prevention initiatives will continue as funding becomes available, but it need not be limited to awarding grants. In the past, IPCP staff have worked with other public and private agencies to help them draft their own proposals for federal, foundation and state funding. Technical assistance and materials have also been provided directly to community groups, as well as suggestions for locating other sources of funding. These activities should continue and be enhanced to the extent possible.

V. HIGH PRIORITY INJURIES

The following injury topics have been selected as initial priorities based on a review of existing data and known, effective interventions: motor vehicle-related injuries, elder falls, poisonings, and fire and burns. Why did we select these injuries? Our data indicate that these four groups of injuries have among the highest incidences and associated costs of all unintentional injuries in Massachusetts (see Appendix A). In addition, there are interventions for each of them that have demonstrated effectiveness.

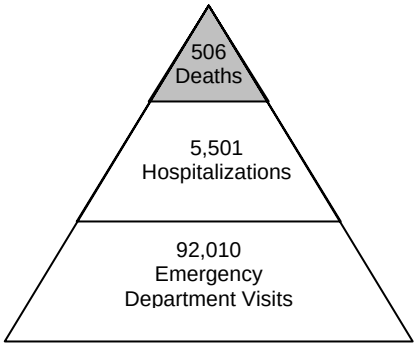
Unintentional Injury Deaths and Non-Fatal Injuries in Massachusetts

	2003	2004	2004	2004
Injury	**# Deaths**	**# In-Patient Non-Fatal Injuries**	**# ED Visits Non-Fatal Injuries**	**Total Charges Hospital & ED**
Unintentional Motor Vehicle Traffic	506	5,486	92,010	$254,677,211
Unintentional Elder Falls (65+)	188	19,340	36,426	$363,831,488
Unintentional Traumatic Brain Injury	470	5,513	33,299	$201,927,970
Unintentional & Undetermined Poisoning	749	3,443	9,274	$44,438,119
Unintentional Fire/Burn	79	559	10,399	$22,472,878
Unintentional Bicycle *(motor vehicle & non motor vehicle-related injuries)*	9	702	9,421	$22,768,052
Unintentional Suffocation	137	370	547	$9,571,639
Unintentional Drowning	45	59	163	$1,247,124
Unintentional Firearm	1	65	162	$1,787,712

Two overarching issues to be considered in each of these priority topics are the prevention of traumatic brain injury (TBI) and the risk factor of alcohol and other substances. Data on TBI indicate that it is third in the number of fatalities and total costs. However, these injuries are frequently caused by motor vehicle-related events and by falls, so for the purpose of this plan, TBI prevention will be integrated into the strategies developed for motor vehicle-related injury and elder fall prevention. With regard to the risk factor of alcohol and other substance abuse, prevention strategies will include coordination with the MDPH Substance Abuse Services Bureau.

The development of quantitative measures of effectiveness to demonstrate accomplishment of the program goals and objectives will be necessary to evaluate our successes and identify areas that need modification.

A. Motor Vehicle Injuries and Deaths



Background

In Massachusetts, motor vehicle crashes are an important cause of death and disability due to injuries. In 2003, 506 people were killed and nearly 100,000 MA residents in 2004 required hospital in-patient and emergency department treatment for injuries related to automobile crashes (including occupants, motorcyclists, pedestrians, and bicyclists). Here's what we know about these injuries:

- Men in Massachusetts are 2-3 times more likely to die from these injuries than are women.
- Elders and young drivers are the two age groups at highest risk for fatal motor vehicle crashes. Adults 75 and over had the highest rates of motor vehicle traffic fatalities, followed by teenagers 15 – 19 years old. Motor vehicle crashes claimed the lives of more Massachusetts young adults than any other injury.
- In 2004, approximately 53% of the people killed in motor vehicle crashes in Massachusetts were unrestrained.[6]
- In 2000, according to the US Department of Transportation, the estimated total economic cost to the Commonwealth for motor vehicle crashes totaled over $6.2 billion. This figure only accounts for acute medical care and does not include rehabilitation costs.

The link with traumatic brain injury:

- Motor vehicle crashes were the third leading cause of traumatic brain injury (TBI) death in Massachusetts between 1995 and 2004 and accounted for almost a quarter of all TBI hospitalizations. Twenty percent (20%) of these deaths were to teens 15–19 years old.

The link with alcohol:

- In 2004, 38% of fatalities from motor vehicle crashes involved an intoxicated driver and an additional 5% were alcohol related (BAC=.01-.07).[7]

What Prevention Methods Are Effective?

Occupant Safety Belts and Child Safety Seats: Research shows that lap/shoulder belts, when used properly, reduce the risk of fatal injury to front seat occupants by 45% and the risk of moderate to critical injury by 50%.[8] While increasing safety belt use in Massachusetts has come a long way over the past decade, the Bay State still has the second lowest reported rate of safety belt use in the nation, at just 64.8%.[8] Massachusetts law requires that all motor vehicle occupants use a safety belt or other appropriate restraint and mandates seatbelt and car seat use for children under 12 years. Adults, however, cannot be penalized for not wearing a seatbelt unless they have committed a

primary moving violation (e.g. speeding, making an illegal turn, driving with an expired license plate). A primary seatbelt law, currently not in effect in Massachusetts, allows police officers to stop drivers for not using their seatbelt. Higher rates of seatbelt use are associated with states that have enacted a primary seatbelt law. These states have an average safety belt rate of 83%.[8]

Laws and Enforcement of Laws Regulating Alcohol Use:

- Raising the minimum legal drinking age (MLDA). The National Highway Traffic Safety Administration (NHTSA) estimates that raising the MLDA to 21 has reduced traffic fatalities involving 18-20 year old drivers by 13% and has saved an estimated 23,733 lives since 1975.
- Blood Alcohol Content (BAC) laws that lower limits to 0.08 percent are associated with declines in alcohol-related fatal crashes.
- Zero-Tolerance Laws, which set the legal BAC limit for drivers younger than age 21 at 0.00 or 0.02 percent, have been associated with a 20% decline in the proportion of drinking drivers under 21 that are involved in fatal crashes.
- Lowering BAC Limits for DUI (Driving Under the Influence) offenders and transportation workers to 0.04-0.05% has proven effective.
- Laws that allow for administrative license suspension (ALS) at the time of arrest have been found to reduce both alcohol-related fatal crashes and repeat DUI offenses.

<u>What Are We Doing in Massachusetts?</u>

Within MDPH:

- The Injury Prevention and Control Program (IPCP) leads and staffs the **Massachusetts Partnership for Passenger Safety**, which includes representatives from over 20 public and private agencies. The Partnership coordinates resources to support motor vehicle safety in Massachusetts. Its goal is to reduce motor vehicle-related injuries and increase public awareness of passenger safety issues. The Partnership also offers a statewide Speaker's Bureau that can provide presentations on child and youth passenger safety.
- IPCP maintains the **Car Safe Line,** a toll-free telephone line for Massachusetts residents who have questions about passenger safety and related Massachusetts laws. Staff can answer questions about passenger safety, distribute educational materials and refer callers to local resources. Because many callers have questions about child safety seats, IPCP staff are trained Child Passenger Safety Technicians and can provide information and refer callers to safety seat checkpoints across the state.
- **The Injury Surveillance Program** conducts surveillance on motor vehicle-related injuries using multiple statewide data sources. These data provide information the magnitude of these events, the type of person injured (occupant, pedestrian, motorcyclist, etc.), recent trends, some circumstantial factors, the types of injuries sustained (including traumatic brain injuries), and demographic breakdowns of these data.

Other Programs:

- **The Massachusetts Governor's Highway Safety Bureau's** mission is to reduce fatalities, injuries and economic losses resulting from motor vehicle crashes in the Commonwealth. The Bureau sponsors a wide range of traffic enforcement programs, the "Click It or Ticket" initiative and has public education materials on child passenger safety, bicycle safety, prevention of drowsy driving and other related topics.
- **Child Safety Seat Checkpoints** are conducted in communities throughout Massachusetts by public safety agencies with trained and certified Child Passenger Safety Technicians. The technicians install or check the installation of child safety seats free of charge and provide safety information to families.
- **Greater Boston SAFE KIDS** and **SAFE KIDS of Western Massachusetts** are two chapters of the National SAFE KIDS Campaign, which includes the SAFE KIDS Buckle Up program, a multifaceted, national effort to improve child passenger safety.
- The **National Highway Traffic Safety Administration** (NHTSA) is a federal government agency that assists states and local communities in reducing the threat of drunk drivers and in promoting the use of safety belts, child safety seats and air bags.
- The **American Academy of Pediatrics** offers a comprehensive collection of resources and materials about keeping children safe in traffic and in automobiles.

Where Are the Gaps in Our Work?

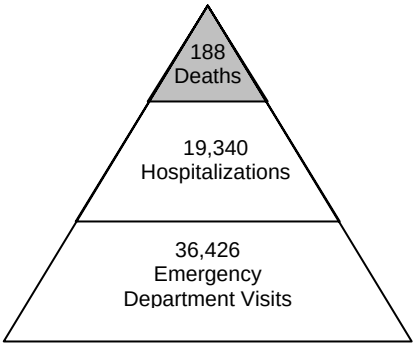
- Legislation: Massachusetts has no primary seat belt law. Legislation regarding alcohol use while driving should be strengthened.
- Better coordination and resource-sharing among all the agencies and programs working on motor vehicle safety would maximize prevention efforts.
- Within MDPH, there are many programs that provide services to families and children. These services could be expanded to include information and education to clients on seatbelt and child safety seat use, the link between car crashes and traumatic brain injury, pedestrian safety, teen safety in cars, and the responsible use of alcohol when driving a vehicle.
- More coordinated work could be done within MDPH on elder driving safety.
- External partners working on TBI prevention could be better integrated into motor vehicle crash prevention work.
- Current surveillance data provides only limited information on the location and circumstances of these events.

Action Steps for Improving Motor Vehicle Safety

1. Collaborate with partners within and outside of MDPH to promote passage of a primary seat belt law.
2. Maintain and enhance MDPH participation and leadership in existing traffic safety-related coalitions and partnerships.

3. Broaden the scope of prevention activity to include TBI prevention and work to enhance the awareness of the link between motor vehicle crashes and brain injury. Include rehabilitation providers in the group of stakeholders.
4. Promote effective community-based interventions to increase the use of safety belts and child safety seats and to reduce alcohol-impaired driving.
5. Enhance the quality of surveillance data on motor vehicle injuries through improved coordination of the motor vehicle injury data collection efforts by various state agencies, and the facilitation of database linkages.
6. Identify the factors that contribute to elder motor vehicle crashes and develop action plans to reduce the associated risk.

B. Fall Related Injuries among the Elderly



Background

Falls are the leading cause of unintentional injury death for men and women 65 and older in Massachusetts and account for nearly one-third of unintentional injury deaths for this population. Although falls are linked to death and injury in all age groups, the elderly are particularly vulnerable. Here's what we know about these injuries:

- From 1999-2003, 74% of fall fatalities were among residents 65 years and older.
- Men are 1.3 times more likely to die due to injuries sustained from a fall than are women. This phenomenon is exacerbated with age.
- Among hospitalizations to Massachusetts elders due to a fall on the same level (e.g. on a sidewalk or floor of a house), 38% sustained a hip fracture.
- In addition to a decrease in physical functioning, falls among the elderly can have deleterious effects on mental health, producing feelings of social isolation, depression and helplessness.
- In 2004, the total hospital charges for fall-related injuries in Massachusetts exceeded $300 million, and the emergency department charges totaled more than $48 million.

The link with traumatic brain injury:

- Overall TBI-associated fatality and hospital discharge rates were highest among residents 75 and older.

The link with alcohol and medication:

- The effect of alcohol on the elderly plays a significant role in increasing their risk for falls. Due to aging-related physiological changes, older adults experience an increase in sensitivity and a decrease in tolerance to both alcohol and medications. Some "over-the-counter" medications and supplements may interact negatively with alcohol and puts elders at greater risk for falls, as may the use of psychoactive medications such as sedatives and anti-anxiety drugs.

What Prevention Methods Are Effective?

Preventive Health Screening: Visual changes, such as macular degeneration, diabetic retinopathy, glaucoma and cataracts can be minimized and controlled through regular vision screenings. Primary care providers or pharmacists can review all medications (both prescriptions and over-the-counter) to reduce side effects and interactions. Physician supervision may even be able to reduce the use of medications and as a result, lower the risk of falls. Finally, an awareness of posture-related blood pressure can prevent the dizziness and falls that frequently occur when elders stand up too quickly.

Lifestyle Changes: A fear of falling often leads to loss of confidence, less social activity, reduced physical activity and a corresponding decrease in lower body strength and conditioning. This can be counteracted by an increase in physical exercise and strength training under medical or other professional supervision. Alcohol consumption should be moderated.

Environmental Modifications: There are a number of household and community environmental and engineering hazards that increase the risk of elder falls. Environmental assessments and modifications, such as installing grab bars, adding raised toilet seats, lowering bed heights and installing handrails where needed can lower the risk of falls, as can improved street lighting in the community and improved visibility marking on curbs and stairs.

What Are We Doing in Massachusetts?

Within MDPH:

- The Massachusetts Department of Public Health, Office of Elder Health, sponsors the **"Keep Moving" Program**. Across the state, 155 walking clubs have been organized for elders who meet two to five times a week to walk together for at least 30 minutes. The program is community-based and is designed to increase physical activity and promote socialization.
- The Injury Surveillance Program conducts surveillance on fall related injuries among elders utilizing several statewide databases. These data provide information on the number of fall-related injuries to elders, the groups at highest risk, the resulting injury diagnoses (such as hip fracture, traumatic brain injury, etc.), limited circumstance information, and recent trends.

Other Programs:

- **Cognitive restructuring** (improving confidence regarding fall prevention and management)
  "It's a Matter of Balance" is a program sponsored by the Roybal Center Consortium at Boston University, Sargent College of Health and Rehabilitation Sciences. The program includes educational materials that combat fear of falling and the importance of exercise.
- **Remembering When**
  "Remembering When: A Fire and Fall Prevention Program for Older Adults" is a curriculum developed by the National Fire Protection Association, CDC, the U.S. Consumer Product Safety Commission, and other partners.
- **Tool Kit to Prevent Senior Falls**
  CDC researchers have developed "The Tool Kit to Prevent Senior Falls," a comprehensive collection of fall prevention materials for health professionals. Available only online, the Tool Kit materials have been produced in both English and Spanish.
- **Evaluation of medications**

Primary care providers or pharmacists review all medications (both prescription and over-the-counter) to reduce side effects and interactions.

- **Screenings**
  Vision tests, fear of falling assessments, alcohol use and postural blood pressure screenings are conducted at the community level to identify those older adults at higher risk for falling.

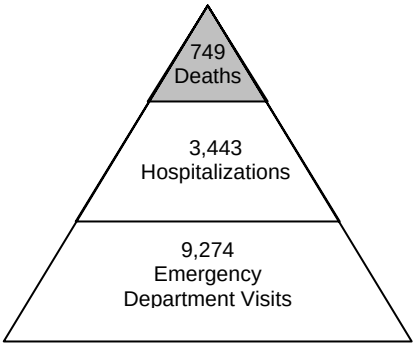
Where Are the Gaps in Our Work?

- There are many risk factors contributing to elder falls and many pathways to preventing them, including poison prevention, physical fitness programs, nutrition programs, health screening programs, and substance abuse prevention. A number of different programs and services work in these fields, but their work is not coordinated in any way.
- More coordinated work could be done within MDPH to strengthen the collaboration of the Elder Health, Injury Prevention and Control, and Injury Surveillance Programs.
- External partners working on elder fall prevention and on TBI could be better integrated into the work being done within MDPH.
- Elder fall prevention could be better integrated into other public health programs targeting adults, including elders.
- Current surveillance data provide only limited information on the location and circumstances of fall-related injuries in Massachusetts.

Action Steps for the Prevention of Falls Among the Elderly

1. Build a coalition of professionals working on elder falls prevention for the purpose of developing a multi-faceted strategic prevention plan. Include a focus on TBI prevention and rehabilitation.
2. Develop a campaign to eliminate safety hazards in the home environment, and distribute home safety checklists through programs serving elders in the community.
3. Increase public and professional awareness of alcohol abuse among elders.
4. Work with the MDPH Elder Health Program to promote exercise programs for elders.
5. Collaborate with the MDPH Injury Surveillance Program to enhance data on how and where falls occur.

C. Deaths and Injuries from Poisonings



Background

Poisoning refers to a damaging bodily effect resulting from the use and misuse of, or other exposure to, pharmaceuticals, illicit drugs, or chemicals, such as pesticides, heavy metals, gases/vapors and common household substances such as bleach and ammonia. Poisoning is currently the leading cause of injury death in Massachusetts, resulting in a total of 749 deaths in 2003 (an increase of 73% between 1999 and 2003). Here's what we know about these injuries:

- Of the 749 unintentional/undetermined poisoning deaths among Massachusetts residents, 659 (88%) were associated with either an opioid or cocaine or both.
- In 2004, there were over 3,400 hospitalizations and over 9,200 emergency department visits for nonfatal unintentional and undetermined poisonings.
- The leading agents responsible for these hospitalizations were heroin and other opioids and benzodiazepine-based tranquilizers.
- In 2004, the total charges for unintentional and undetermined poison-related hospitalizations and emergency department visits in the Commonwealth were over $44 million.
- Unintentional and undetermined poisoning fatality rates in 2003 were highest among persons 35 to 44 years of age.
- Adults 75 years and over have the highest rates of hospitalization for unintentional and undetermined poisonings in Massachusetts. The elderly are at risk for poisoning if their medications are mismanaged or incorrectly taken or administered.
- Men in Massachusetts were 2.6 times as likely to die from poisoning as women.
- Small children are at risk for poisoning in the home and other settings when there is lack of supervision.
- Teens and adults are at risk for poisoning through the misuse of prescription drugs and/or the use of illicit drugs or other substances.

What Prevention Methods Are Effective?

- Primary prevention of substance abuse problems and availability of drug treatment programs.
- Awareness and use of Poison Control Centers, 911 and EMS system
- Child-proof medicine caps and other environmental modifications (blister packaging, locked cabinets, etc.)
- Maximums on the volume of medication or number of pills dispensed.

- Adequate medical supervision of elders' medication use.

What Are We Doing in Massachusetts?

Within MDPH:

- **Bureau of Substance Abuse Services (BSAS) at MDPH** oversees substance abuse prevention and treatment services in the Commonwealth. Responsibilities include: licensing programs and counselors; funding and monitoring prevention and treatment services; providing access to treatment for the indigent and uninsured; developing and implementing policies and programs; and tracking substance abuse trends in the state.
- The **Injury Surveillance Program** at the MDPH conducts surveillance on poisonings in Massachusetts using the available core data sources recommended by the State and Territorial Injury Prevention Directors' Association (STIPDA) and through the use of the National Violent Death Reporting System – Massachusetts Database. Data on poisonings is disseminated to injury prevention practitioners, policy makers, researchers and other interested parties.

Other Programs:

- The **Regional Center for Poison Control and Prevention** serving Massachusetts and Rhode Island provides poison exposure and information services to the public and to health care clinicians. Funded by both state health departments and federal grants, the Center staffs a 24/7 hotline with nurses and pharmacists certified to provide advice on poisonings and poison identification. The Center also does outreach and education to the public in both states and responds to an Advisory Committee with members from both Massachusetts and Rhode Island.

Where Are the Gaps in Our Work?

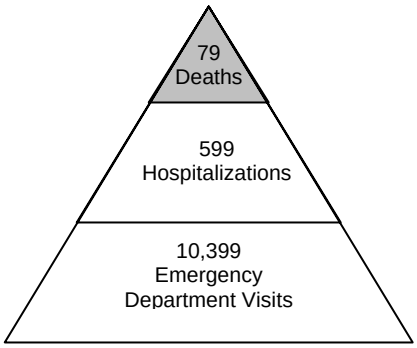
- Poisonings are related to many different issues, including suicide, substance abuse, and elder medication misuse, but professionals working on these different concerns do not always collaborate.
- Treatment for substance abuse is not adequate to the demand in Massachusetts.
- We still do not know how to do the most effective outreach to non-English speaking populations, who are at risk for unintentional poisoning and do not often use poison control centers.
- Poison prevention education does not yet reach all parents of young children.
- The financial stability of the Regional Center for Poison Control and Prevention is not assured.
- Improvement is needed in the systematic collection, analysis and dissemination of information on poison agents, their sources, and the circumstances of poisonings.

Action Steps for the Prevention of Poisoning

1. Develop a multi-disciplinary coalition to prevent poisoning.
2. Work with the Bureau of Substance Abuse to enhance drug treatment availability.

3. Work with the Regional Center to promote outreach and education to non-English speaking populations.
4. Develop an education plan to prevent childhood poisonings targeted at parents and caregivers.
5. Work with the health care community to develop a plan for improved data collection with regard to poisonings.

D. Fire and Burn Related Injuries



Background

Tragically, over three-quarters of the fire deaths and the majority of non-fatal burn injuries to Massachusetts residents in 2004 occurred in the "safety" of the victims' own homes. Here's what we know about these injuries, many of which are associated with highly preventable risk factors:

- Fires and burns in Massachusetts were responsible for 79 deaths in 2003, and for 599 non-fatal hospitalizations and 10,399 emergency department visits in 2004.
- Scalds, which are defined as burns resulting from contact with hot surfaces, liquids, steam, or other hot substances, are the leading cause of burn-related emergency department visits and inpatient hospitalizations.
- The leading cause of residential fires in 2004 was the improper or unsafe use of smoking materials.
- Children under age 5, adult men and women, and individuals in certain occupations, such as restaurant kitchen workers, are the groups at highest risk for fire and burn injuries.
- In 2004, total inpatient and emergency department charges for unintentional fire/burn-related injuries were over $22 million. Furthermore, over 50% of burn-related hospitalizations were paid through either Medicare or Medicaid. The financial burden associated with burn-related injuries is not confined to health care charges. Estimates indicate that property damages alone amounted to $205 million in 2001.

What Prevention Methods Are Effective?

- Installation and regular maintenance of smoke alarms
- A rehearsed escape plan for families with young children
- Restriction of fireworks to trained professionals
- Care in cooking practices
- Lowered hot water heater and bath temperatures
- No use of fire or cigarettes in the presence of supplemental oxygen
- Ongoing public education on fire and burn prevention, with a focus on employers and workers in high risk industries
- Care in the disposal of smoking materials

What Are We Doing in Massachusetts?

Within MDPH:

- **The Residential Fire Injury Prevention Project:**
  This project is funded by a five-year grant (7/1/2002 – 6/30/2006) from the national Centers for Disease Control and Prevention. The purpose of the project is to increase the installation of smoke alarms and to provide in-home fire safety education for at-risk families and individuals in Massachusetts. The IPCP, in collaboration with the State Fire Marshal's Office, is working with local fire departments and other community agencies to install smoke alarms and provide fire safety education in low income, high risk households. Currently, fire departments are providing this service to low-income families and individuals, elderly and immigrant and refugee populations in Massachusetts.
  - The Injury Surveillance Program conducts surveillance on burns related to fires and hot substances utilizing multiple statewide data sources. These data provide information on the number of burn deaths, hospitalizations, emergency department visits among MA residents, as will as demographic risk factors and trend information.

Other Efforts and Programs:

- A number of **state laws** target fire prevention and safety initiatives, with many of these laws originating from the Office of the State Fire Marshal. These laws address the creation and maintenance of the State Fire Marshal's office, the Department of Fire Services and Fire Departments and Districts. In August 2004, the Governor of Massachusetts signed a fire safety bill that requires any nightclub with an occupancy of 100 or more to install a sprinkler system within a three year period.
- The Department of Fire Services, **Office of the State Fire Marshal** sponsors fire safety events throughout the Commonwealth as well as the annual Fire and Public Education Conference. Educational and informational materials are produced on a variety of fire safety topics that local fire departments may use to educate the public. There is also a special effort to reduce the incidence of smoking while on supplementary oxygen.

Where Are the Gaps in Our Work?

- There are still many homes without working smoke alarms.
- There has not been adequate public education on the importance of family escape plans.
- Public education needs to be expanded to prevent scalds.
- The public education campaign needs to be enhanced on the dangers of smoking in the presence of supplementary oxygen.
- The MA Burn Registry collects detailed information on burns totaling over 5% of the body. Treating clinicians are required to report this information. Many burns, however, go unreported, reducing the quality of the data available through this important data source.

Action Steps for the Prevention of Fire and Burn Related Injuries

1. Continue to support community-level promotion of smoke alarm installation and maintenance.
2. Develop a public education campaign for families that focuses on escape plans.
3. Develop a public education campaign to reduce the incidence of scalds.
4. Collaborate with the Office of the Fire Marshal's existing efforts to reduce the incidence of smoking in the presence of supplementary oxygen.
5. Work with the State Fire Marshal's office and medical providers to improve the reporting of burn injuries to the MA Burn Registry.

Appendix A. Injuries to MA Residents, Total Numbers and Direct Charges

2003 FATAL AND 2004 NON-FATAL INJURIES TO MA RESIDENTS

	NUMBER of Injuries to MA Residents				TOTAL Charges			COMBINED CHARGES FOR NON-FATAL INJURIES
		In-Patient			In-Patient			
Selected Injury Cause:	# of Deaths (in 2003)	# of Non-fatal Hospital Discharges	# of Non-fatal Observation Bed Stays	# of Non-fatal ED Injury Visits	TOTAL Hospital Charges	TOTAL Observation Charges	TOTAL ED Charges	
Unintentional MV Traffic	506	4,532	954	92,010	$153,013,984	$7,931,859	$93,731,368	$254,677,211
Unintentional Elder Falls (65+)	188	18,343	997	36,426	$309,415,604	$5,628,230	$48,787,654	$363,831,488
Unintentional Fire/Burn	79	491	68	10,399	$16,777,078	$265,217	$5,430,583	$22,472,878
Unintentional Drowning	45	41	18	163	$1,005,103	$50,118	$191,903	$1,247,124
Unintentional Suffocation	137	345	25	547	$8,995,369	$92,943	$483,327	$9,571,639
Unintentional Bicycle (MV & Non-MV)	9	560	142	9,421	$11,275,134	$1,160,003	$10,332,915	$22,768,052
Unintentional Firearm	1	51	14	162	$1,500,589	$59,824	$227,299	$1,787,712
Unintentional & Undetermined Poisoning	749	2,629	814	9,274	$31,669,199	$2,662,947	$10,105,973	$44,438,119
Unintentional TBI	470	4,502	1,011	33,299	$134,745,046	$7,028,742	$60,154,182	$201,927,970
ALL UNINTENTIONAL INJURY	1,397	44,342	6,900	674,649	$843,802,776	$46,369,638	$548,227,982	$1,438,400,396
ALL OTHER INJURY *(Intentional, Undetermined & Other)*	1,329	10,765	2,611	43,685	$210,275,625	$19,770,276	$54,853,261	$284,899,162
TOTAL INJURIES	2,726	55,107	9,511	718,334	$1,054,078,401	$66,139,914	$603,081,243	$1,723,299,558

Sources:
Registry of Vital Records and Statistics, MA Department of Public Health
MA Hospital Discharge Database, Division of Health Care Finance and Policy
MA Observation Bed Stays Database, Division of Health Care Finance and Policy
MA Emergency Department Database, Division of Health Care Finance and Policy

Appendix B: Contributors to the Injury Prevention Plan

Adam Avery – Regional Center for Poison Control and Prevention
Terri Anderson – MDPH ASETS
Janet Berkenfield – MDPH, Injury Prevention and Control Program, EMSC Project
Erin Christiansen – Boston Public Health Commission
Lillian Colavecchio – MDPH, Office of Elder Health
Letitia Davis – MDPH, Occupational Health Surveillance Program
Marci Diamond – MDPH, Sexual Assault Prevention Services and Support
Christine Farrell– MDPH, Injury Prevention and Control Program, Fire Prevention Project
Sally Fogerty – MDPH, Center for Community Health
Daksha Gopal– MDPH, Injury Surveillance Program
Suzanne Gottlieb – MDPH, Children with Special Health Care Needs Program
Ruth Grabel– MDPH, Office of Elder Health
Holly Hackman – MDPH, Injury Surveillance Program
Barbara Harrington – Mothers Against Drunk Driving
Alicia High – MDPH, WIC Program
Alan Holmlund– MDPH, Injury Prevention and Control Program, Suicide Prevention
Sarah Hughes– MDPH, Injury Prevention and Control Program
Beth Hume– MDPH, Injury Surveillance Program
Deborah Kamen – MA Rehabilitation Commission, Statewide Head Injury Prevention
Arlene Korab – Massachusetts Brain Injury Association
Lareina La Flair– MDPH, Injury Prevention and Control Program
Joshua Lehman – MA Highway Department
Neil Maniar– MDPH, Injury Prevention and Control Program
Barbara McEachern – US Consumer Product Safety Commission, Boston
Colleen McGuire – UMass Injury Free Coalition for Kids
Maria McKenna – MDPH, Injury Surveillance Program
Loreta McKeown– MDPH, Injury Surveillance Program
Janice Mirabassi – MDPH, Women's Health Network
Jennifer Mieth – Department of Fire Safety, Office of the Fire Marshal
Jerry O'Keefe – MDPH, Center for Health Information, Statistics, Research and Evaluation
Carlene Pavlos – MDPH, Division of Violence and Injury Prevention
Beatriz Pazos – MDPH, Occupational Health Surveillance Program
Cindy Rodgers – MDPH, Injury Prevention and Control Program
Julie Ross –Children's Hospital Boston, Injury Free Coalition for Kids
Ellen Schmidt – Children's Safety Network
Steve Shuman – ACF Head Start Quality Initiative
Erica Streit – Children's Safety Network
Mandi Summers – Western Massachusetts Safe Kids Coalition
Janice Ventre– MDPH, Injury Prevention and Control Program
Veronica Vieira– MDPH, Injury Surveillance Program

Appendix C: Injury Deaths

Injury Fatalities 2003

MASSACHUSETTS RESIDENTS

- There were 2,726 injury fatalities among Massachusetts residents in 2003, a rate of 42.4 fatalities per 100,000 residents.

INJURY CAUSE	INJURY INTENT					Total Number	Percent of Total	Crude Rate per 100,000[2]
	Unintentional	*Intentional*		Undetermined	Other & Legal[1]			
		Suicide	Homicide					
Cut/pierce	1	13	35	1	0	50	1.8	**0.8**
Drowning/submersion	45	5	0	17		67	2.5	**1.0**
Fall	248	20	0	4		272	10.0	**4.2**
Fire/burn	79	5	0	7		91	3.3	**1.4**
Firearms	1	121	77	2	1	202	7.4	**3.1**
Machinery	8					8	0.3	**0.1**
Natural/environmental	20					20	0.7	**0.3**
Overexertion	0					0	0.0	**0.0**
Poisoning	75	87	0	674	0	836	30.7	**13.0**
Struck by, against	7	0	9	0	0	16	0.6	**0.2**
Suffocation/hanging	137	160	7	1		305	11.2	**4.7**
Transport Injuries:	542	2	0	0	0	544	20.0	**8.5**
Motor vehicle traffic-related	506					506	18.6	**7.9**
Occupant	94					94	3.4	**1.5**
Motorcyclist	40					40	1.5	**0.6**
Pedal cyclist	7					7	0.3	**0.1**
Pedestrian	78					78	2.9	**1.2**
Other person	0					0	0.0	**0.0**
Unspecified person	287					287	10.5	**4.5**
Pedal cyclist, other	2					2	0.1	**--**
Pedestrian, other	9					9	0.3	**0.1**
Other land transport	14					14	0.5	**0.2**
Other transport	11					11	0.4	**0.2**
Other specified & classifiable	5	6	5	3	0	19	0.7	**0.3**
Other specified, not classifiable	14	2	0	3	0	19	0.7	**0.3**
Unspecified	215	2	6	11	0	234	8.6	**3.6**
Adverse Effects[3]						43	1.6	**0.7**
TOTAL DEATHS	***1,397***	***423***	***139***	***723***	***1***	***2,726***	***100%***	***42.4***
Injury Death Rate by Intent	21.7	6.6	2.2	11.2	--	n/a	n/a	n/a

Source: ***Registry of Vital Records and Statistics, Massachusetts Department of Public Health.***

[1] Legal Intervention includes fatalities resulting from police actions and operations of war.

[2] Rates are per 100,000 residents. Rates provided here are not age-adjusted and may differ slightly from other department publications. Rates are not calculated on counts of less than five. Rates that are based on counts less than twenty may be unstable.

[3] Adverse Effects can be related to medical and surgical care procedures, or to the use of therapeutic substances (including allergic reactions).

—An injury-related fatality is defined as any death with an ICD-10 code of U01-U03 or V01-Y89 in the underlying cause field.
—Categories and groupings are based on a modified version of the CDC's "Recommended framework of E-code groupings for presenting injury mortality and morbidity data." This framework does not provide for intentionality for certain cause categories as indicated by gray shading.
—Injury subcategories are italicized.
—Analysis is based on a calendar year (Jan 1 - Dec 31, 2003).
—Massachusetts residents who died in or out-of-state are included in this analysis: non-Massachusetts residents are excluded from the analysis.
—Population data used to calculate rates are based on US Census Bureau estimates (www.census.gov/popest/states/asrh/files/SC-EST2003-race6-AL_MO.csv)
—Beginning in 1999 a new revision of the International Classification of Disease system (ICD-10) was used to code for cause of death. Please note that years prior to 1999 may not be comparable.
—Data were extracted and compiled by the Injury Surveillance Program, MDPH, June 2005.

Appendix C: Injury-related Hospital Discharges

Injury-related Hospital Discharges 2004*

MASSACHUSETTS RESIDENTS

INJURY CAUSE	INJURY INTENT					Total Number	Percent of Total	Rate per 100,000[2]
	Unintentional	*Intentional*		Undetermined	Other & Legal[1]			
		Self-Inflicted	Assault					
Cut/pierce	664	551	426	10	0	1,651	3.0	25.7
Drowning/submersion	41	1	0	0		42	0.1	0.7
Fall	25,666	20	5	15		25,706	46.6	400.6
Fire/burn	491	28	5	8		532	1.0	8.3
Fire/flame	201	28	2	6		237	0.4	3.7
Hot object/substance burn	290	0	3	2		295	0.5	4.6
Firearms	51	1	197	18	8	275	0.5	4.3
Machinery	266					266	0.5	4.1
Natural/environmental	970	2		3		975	1.8	15.2
Dog bites	151	0		0		151	0.3	2.4
Other bites & stings	477	0		0		477	0.9	7.4
All other	342	2		3		347	0.6	5.4
Overexertion	1,010					1,010	1.8	15.7
Poisoning	2,081	2,997	0	548	0	5,626	10.2	87.7
Struck by, against	1,168		567		8	1,743	3.2	27.2
Suffocation/hanging	345	28	5	1		379	0.7	5.9
Transport Injuries:	5,554	8	4	1		5,567	10.1	86.8
Motor vehicle traffic-related	4,532	8	4	1		4,545	8.2	70.8
Occupant	2,995					2,995	5.4	46.7
Motorcyclist	571					571	1.0	8.9
Pedal Cyclist	153					153	0.3	2.4
Pedestrian	632					632	1.1	9.8
Other person	36					36	0.1	0.6
Unspecified person	145					145	0.3	2.3
Pedal cyclist, other	407					407	0.7	6.3
Pedestrian, other	57					57	0.1	0.9
Other transport	558					558	1.0	8.7
Other specified & classifiable	2,227	4	142	1	0	2,374	4.3	37.0
Human bites	35	0	0	0	0	35	0.1	0.5
Non-powder guns	14	0	0	0	0	14	0.0	0.2
Other specified & classifiable	2,178	4	142	1	0	2,325	4.2	36.2
Other specified, not classifiable	786	99	156	110	17	1,168	2.1	18.2
Unspecified	3,022	30	157	20	1	3,230	5.9	50.3
Adverse effects[3]						2,354	4.3	36.7
Cause and intent are not provided						2,209	4.0	34.4
TOTALS [4]	***44,342***	***3,769***	***1,664***	***735***	***34***	***55,107***	***100%***	***858.8***
RATE BY INTENT/per 100,000	***691.1***	***58.7***	***25.9***	***11.5***	***0.5***			

Source: ***Massachusetts Hospital Discharge Database, MA Division of Health Care Finance and Policy.***

*All data sets from Health Care Finance and Policy are based on a fiscal year. The numbers provided here are based on fiscal year: October 1, 2003 - September 30, 2004 and will be different than numbers generated through the Department's query based system MassCHIP.

[1] Legal Intervention includes injuries resulting from police actions and operations of war.

[2] Rates are not calculated on counts of less than five. Rates that are based on counts less than twenty may be unstable.

[3] Adverse Effects can be related to medical and surgical care procedures, or to the use of therapeutic substances (including allergic reactions).

[4] Totals do not include subcategory counts.

—An injury hospitalization is defined as any case having an ICD9-CM Nature of Injury Code of 800-999 assigned to any of the ICD9 diagnosis fields [cases having the following codes are excluded if no other valid ICD9-CM code is assigned: Certain Adverse Effects (995.0-995.4, 995.6,995.7, 995.86, 995.89), Complications of Surgical & Medical Care (996-999), and certain Late Effects (909.3,909.5)]

—Categories and groupings are based on a modified version of the CDC's "Recommended framework of E-code groupings for presenting injury mortality and morbidity data." This framework does not provide for intentionality for certain cause categories as indicated by gray shading.

—Injury subcategories are italicized.

—Only Massachusetts residents with valid MA zip codes are included in this analysis.

—Injury hospitalization cases transferred to another acute care facility or subsequently dying in the hospital, are excluded from this analysis.

—Population data used to calculate rates are based on 2004 population estimates released August 11, 2005 by the US Census Bureau. Estimated 2004 Massachusetts population is 6,416,505.

—Data were extracted and compiled by the Injury Surveillance Program, MDPH, February 2006.

Appendix C: Injury-related Outpatient Observation Stays

Injury-related Outpatient Observation Stays 2004*

MASSACHUSETTS RESIDENTS

INJURY CAUSE	INJURY INTENT					Total Number	Percent of Total	Crude Rate per 100,000[2]
	Unintentional	*Intentional*		Undetermined	Other & Legal[1]			
		Self-Inflicted	Assault					
Cut/pierce	128	47	85	0	0	260	2.7	4.1
Drowning/submersion	18	0	0	0		18	0.2	0.3
Fall	2714	1	0	1		2,716	28.6	42.3
Fire/burn	68	1	0	0		69	0.7	1.1
Fire/flame	33	1	0	0		34	0.4	0.5
Hot object/substance burn	35	0	0	0		35	0.4	0.5
Firearms	14	0	29	1	2	46	0.5	0.7
Machinery	39					39	0.4	0.6
Natural/environmental	205	0		1		206	2.2	3.2
Dog bites	24	0		0		24	0.3	0.4
Other bites & stings	130	0		0		130	1.4	2.0
Other (e.g., extreme cold)	51	0		1		52	0.5	0.8
Overexertion	349					349	3.7	5.4
Poisoning	671	441	0	143	0	1,255	13.2	19.6
Struck by, against	371		196		3	570	6.0	8.9
Suffocation/hanging	25	1	0	0	0	26	0.3	0.4
Transport Injuries:	1,209	0	0	2		1,211	12.7	18.9
Motor vehicle traffic-related	954	0	0	2		956	10.1	14.9
Occupant	712					712	7.5	11.1
Motorcyclist	75					75	0.8	1.2
Pedal cyclist	28					28	0.3	0.4
Pedestrian	92					92	1.0	1.4
Other person	5					5	0.1	0.1
Unspecified person	42					42	0.4	0.7
Pedal cyclist, other	114					114	1.2	1.8
Pedestrian, other	7					7	0.1	0.1
Other transport	134					134	1.4	2.1
Other specified & classifiable	341	0	40	1	0	382	4.0	6.0
Human bites	5	0	5	0	0	10	0.1	0.2
Non-powder gun (bb, pellet)	5	0	2	1	0	8	0.1	0.1
Other specified & classifiable	331	0	33	0	0	364	3.8	5.7
Other specified, not classifiable	145	11	19	18	1	194	2.0	3.0
Unspecified	592	6	34	3	0	635	6.7	9.9
Cause Code is incomplete	11	0	0	0	0	11	0.1	0.2
Adverse effects[3]	--	--	--	--	--	109	1.1	1.7
Cause and Intent are not provided	--	--	--	--	--	1,415	14.9	22.1
TOTALS	***6,900***	***508***	***403***	***170***	***6***	***9,511***	***100%***	***148.2***
RATE BY INTENT/per 100,000	***107.5***	***7.9***	***6.3***	***2.6***	***0.1***			

Source: ***MA Outpatient Observation Stay Database, MA Division of Health Care Finance and Policy.***

*All data sets from the Division of Health Care Finance and Policy are based on a fiscal year. The numbers provided here are based on fiscal year: October 1, 2003 - September 30, 2004 and will be different than numbers generated through the Department's query based system MassCHIP.

[1] Legal Intervention includes injuries resulting from police actions and operations of war.

[2] Rates are not calculated on counts of less than five. Rates that are based on counts less than twenty may be unstable.

[3] Adverse Effects can be related to medical and surgical care procedures, or to the use of therapeutic substances (including allergic reactions).

[4] Totals do not include subcategory counts. Total percentage may be less or more than 100% due to rounding, but is presented here as 100%.

—This database contains cases admitted to a hospital bed for "observation," these cases are not included in the Massachusetts Hospital Discharge Database.

—An injury-related "observation" case is defined as any case having an ICD9-CM Nature of Injury Code of 800-999 assigned to any of the ICD9 diagnosis fields [cases having the following codes are excluded if no other valid ICD9-CM code is assigned: Certain Adverse Effects (995.0-995.4, 995.6,995.7, 995.86, 995.89), Complications of Surgical & Medical Care (996-999), and certain Late Effects (909.3,909.5)].

—Categories and groupings are based on a modified version of the CDC's "Recommended framework of E-code groupings for presenting injury mortality and morbidity data." This framework does not provide for intentionality for certain cause categories as indicated by gray shading.

—Injury subcategories are italicized.

—Only Massachusetts residents with valid MA zip codes are included in this analysis.

—Injury observation cases subsequently dying in the hospital are excluded from this analysis.

—Population data used to calculate rates are based on 2004 population estimates released August 11, 2005 by the US Census Bureau. Estimated 2004 Massachusetts population is 6,416,505.

—Data were extracted and compiled by the Injury Surveillance Program, MDPH, January 2006.

Appendix C: Injury-related Emergency Department Visits

Injury-related Emergency Dept. Visits 2004*

MASSACHUSETTS RESIDENTS

INJURY CAUSE	INJURY INTENT					Total Number	Percent of Total	Crude Rate per 100,000[2]
	Unintentional	*Intentional*		Undetermined	Other & Legal[1]			
		Self-inflicted	Assault					
Cut/pierce	71,461	2,344	1,574	183	2	75,564	10.5	1,177.7
Drowning/submersion	163	0	3	1		167	< .1	2.6
Fall	174,062	21	32	59		174,174	24.2	2,714.5
Fire/burn	10,399	51	43	23		10,516	1.5	163.9
Fire/flame	1,719	41	16	19		1,795	0.2	28.0
Hot object/substance	8,680	10	27	4		8,721	1.2	135.9
Firearm	162	3	169	62	6	402	0.1	6.3
Machinery	4,672					4,672	0.7	72.8
Natural/Environmental	27,071	1		9		27,081	3.8	422.1
Dog bites	6,307	0		0		6,307	0.9	98.3
Other bites & stings	18,019	0		0		18,019	2.5	280.8
All other (e.g. extreme cold)	2,745	1		9		2,755	0.4	42.9
Overexertion	84,931					84,931	11.8	1,323.6
Poisoning	6,600	3,595	29	2,674	6	12,904	1.8	201.1
Struck by, against	101,313		13,969		408	115,690	16.1	1,803.0
Suffocation	547	60	32	5		644	0.1	10.0
Transport-related Injuries	105,526	8	21	2		105,557	14.7	1,645.1
Motor vehicle traffic-related	92,010	8	21	2		92,041	12.8	1,434.4
Occupant	80,179					80,179	11.2	1,249.6
Motorcyclist	2,584					2,584	0.4	40.3
Pedal cyclist	1,151					1,151	0.2	17.9
Pedestrian	3,709					3,709	0.5	57.8
Unspecified person	4,062					4,062	0.6	63.3
Other person	325					325	< .1	5.1
Pedal cyclist, other	8,270					8,270	1.2	128.9
Pedestrian, other	434					434	0.1	6.8
Transportation, other	4,812					4,812	0.7	75.0
Other-specified & classifiable	36,663	14	2,371	36	7	39,091	5.4	609.2
Human bites	561		1,043			1,604	0.2	25.0
Non-powder gun (BB, pellet)	393	0	54	0	0	447	0.1	7.0
Other specified & classifiable	35,709	14	1,274	36	7	37,040	5.2	577.3
Other specified, not classifiable	7,752	364	3,539	232	8	11,895	1.7	185.4
Unspecified	43,319	172	2,100	116	87	45,794	6.4	713.7
Cause Code is incomplete	8	0	0	0	0	8	< .1	0.1
Adverse effects[3]	--	--	--	--	--	2,857	0.4	44.5
Cause and Intent are not provided	--	--	--	--	--	6,387	0.9	99.5
TOTALS	***674,649***	***6,633***	***23,882***	***3,402***	***524***	***718,334***	***100%***	***11,195.1***
RATE BY INTENT/per 100,000	***10,514.3***	***103.4***	***372.2***	***53.0***	***8.2***			

Source: ***MA Emergency Department Discharge Database, MA Division of Health Care, Finance and Policy.***

*All data sets from Health Care Finance and Policy are based on a fiscal year. The numbers provided here are based on fiscal year: October 1, 2003 - September 30, 2004 and will be different than numbers generated through the Department's query based system MassCHIP.

[1] Legal Intervention includes injuries resulting from police actions and operations of war.

[2] Rates are not calculated on counts of less than five. Rates that are based on counts less than twenty may be unstable.

[3] Adverse Effects can be related to medical and surgical care procedures, or to the use of therapeutic substances (including allergic reactions).

[4] Totals do not include subcategory counts.

—An emergency department injury discharge is defined as any case having an ICD9-CM Nature of Injury Code of 800-999 assigned to any of the ICD9 diagnosis fields [cases having the following codes are excluded if no other valid ICD9-CM code is assigned: Certain Adverse Effects (995.0-995.4, 995.6,995.7, 995.86, 995.89), Complications of Surgical & Medical Care (996-999), and certain Late Effects (909.3,909.5)]

—Categories and groupings are based on a modified version of the CDC's "Recommended framework of E-code groupings for presenting injury mortality and morbidity data." This framework does not provide for intentionality for certain cause categories as indicated by gray shading.

—Injury subcategories are italicized.

—Only Massachusetts residents with valid MA zip codes are included in this analysis.

—ED injury cases subsequently dying in the hospital are excluded from this analysis.

—Population data used to calculate rates are based on 2004 population estimates released August 11, 2005 by the US Census Bureau. Estimated 2004 Massachusetts population is 6,416,505.

—Data were extracted and compiled by the Injury Surveillance Program, MDPH, February 2006.

References:

[1] State and Territorial Injury Prevention Directors Association (STIPDA), *Safe States*, 2003.
[2] MDPH Injury Surveillance Program.
[3] National Committee for Injury Prevention and Control, *Injury Prevention: Meeting the Challenge*, 1989, p. 8.
[4] Ibid, pp. 31-33.
[5] STIPDA, op. cit.
[6] Fatality Analysis Reporting System (FARS), National Highway Traffic Safety Administration (NHTSA).
[7] Based on the FARS data of driver alcohol test results.
[8] National Occupant Protection Use Survey (NOPUS), National Highway Traffic Safety Administration (NHTSA).